

Claims 1-4 and 8-17 stand rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,961,700 to Dunbar in view of Japanese Patent No. JP 05154868 A to Momotome, U.S. Patent No. 5,800,759 to Yamazaki et al., U.S. Patent No. 4,328,067 to Cesano, U.S. Patent No. 5,188,787 to King et al. and U.S. Patent No. 5,032,106 to Warburton. This rejection is respectfully traversed.

Claim 1 recites a method of manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other. As recited in claim 1, the method comprises: placing the sheet on the first portion of the open mold; pressing the sheet against the first portion at at least one location using at least one pusher mounted on the second portion of the mold and movable relative to said second portion; closing the mold so that a portion of the sheet projecting from the join plane after the mold has closed; compacting the sheet; trimming off a portion of the sheet projecting from the join plane after the mold has closed; and unmolding the part. It is respectfully submitted that the applied references do not disclose, teach or suggest, in permissible combination, these claimed features.

As admitted in the Office Action, Dunbar does not disclose trimming off a portion of the sheet projecting from the join plane. The Office Action cites Warburton, King et al., Cesano, Yamazaki et al. and Momotome in support of the assertion that it is well-known in the art to trim or cut off sheet portions during or after press molding operations while the sheet is in the mold. However, it is respectfully submitted that the asserted combination of references is improper because there is no motivation for one of ordinary skill in the art to combine the references with Dunbar and, therefore, the asserted combination is based on impermissible hindsight reasoning.

The Office Action asserts that one of ordinary skill in the art would have been motivated to trim off a portion of the sheet projecting from the join plane because it is "well

known in the art after the press molding of the sheet in the process as taught by Dunbar in order to cut the press molded sheet to final shape while the sheet is already clamped down and to also ensure that the sheet is precisely cut to the desired shape." Applicant respectfully disagrees.

It is respectfully submitted that Dunbar teaches away from trimming off a portion of the sheet projecting from the join plane after the mold has closed, as recited in claim 1. As disclosed in Fig. 4 and column 5, lines 6-15 of Dunbar, a predetermined length of the blanket 30 is unrolled, cutoff and placed in the mold. As shown in Fig. 4, after the mold 12, 14 is closed, no portion of the blanket projects from the join plane, contrary to claim 1. After a suitable period of time, the mold is opened and the finished perform product is removed.

Dunbar thus teaches cutting the blanket 30 to the exact size required to mold the finished product. Thus, a trimming step is unnecessary in the process disclosed by Dunbar. Further, cutting the blanket 30 to the exact size before molding as taught by Dunbar avoids a waste of material. Since a binder material/resin matrix is added to the blanket 30 to cure the blanket 30 in the permanent molded shape, any sheet material hypothetically trimmed off after the initial cutting will be wasted because the cured binder material/resin matrix is not reshapeable, as further discussed below. A person of ordinary skill in the art would not have been motivated to modify the process disclosed by Dunbar in such a way that unnecessarily increases the cost of manufacture by wasting material and/or adding a superfluous step.

During the interviews, the Examiners maintained that trimming is too well-known in the art. However, absent a motivation to modify the process of Dunbar to include a trimming step, it is respectfully submitted that the asserted combination of references is based on impermissible hindsight. Accordingly, the rejection of claim 1 under 35 U.S.C. §103(a) over Dunbar in view of JP 05154868 A, Yamazaki et al., Cesano, King et al. and Warburton is improper and should be withdrawn.

Claim 11 recites a mold for forming a sheet of reinforced plastics material comprising: first and second portions that are movable relative to each other; at least one pusher mounted on the second portion and movable relative thereto so as to press said sheet at least locally against the first portion before the mold is closed; and at least one trimmer enabling the portion of the sheet that projects from the join plane to be trimmed off once the mold is closed. It is respectfully submitted that the applied references do not disclose, teach or suggest, in permissible combination, these claimed features.

As admitted in the Office Action, Dunbar fails to disclose at least one trimmer/trimming means. The Office Action cites Warburton, King et al., Cesano, Yamazaki et al. and Momotome in support of the assertion that it is well-known in the art to include trimming means in a molding tool to trim or cut off sheet portions during or after press molding operations while the sheet is in the mold. However, for the reasons set forth above, the asserted combination of references is improper because there is no motivation for one of ordinary skill in the art to combine the references with Dunbar.

As discussed above, a trimming step is unnecessary in the process disclosed by Dunbar and such hypothetical trimming would result in a waste of material. A person of ordinary skill in the art would not have been motivated to modify the apparatus disclosed by Dunbar to include a feature that is unnecessary for the process and would increase the cost and the complexity of the molding apparatus.

Absent a motivation to modify Dunbar to include a trimming means, it is respectfully submitted that the asserted combination of references is based on impermissible hindsight. Accordingly, the rejection of claim 11 under 35 U.S.C. §103(a) over Dunbar in view of JP 05154868 A, Yamazaki et al., Cesano, King et al. and Warburton is improper and should be withdrawn.

Claim 17 recites an apparatus for manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other. As recited in claim 17, the apparatus comprises: means for placing the sheet on the first portion of the open mold; means for pressing the sheet against the first portion at at least one location using at least one pusher mounted on the second portion of the mold and movable relative to said second portion; means for closing the mold, a portion of the sheet projecting from the join plane after the mold has closed; means for compacting the sheet; means for trimming off the portion of the sheet that projects from the join plane; and means for unmolding the part. It is respectfully submitted that the applied references do not disclose, teach or suggest, in permissible combination, these claimed features.

The arguments made above with respect to claim 11 fully apply to claim 17. Therefore, it is respectfully submitted that there is no motivation to modify the apparatus of Dunbar to include trimming means and that the asserted combination of references is based on impermissible hindsight. Accordingly, the rejection of claim 17 under 35 U.S.C. §103(a) over Dunbar in view of JP 05154868 A, Yamazaki et al., Cesano, King et al. and Warburton is improper and should be withdrawn.

Claim 15 recites a method of manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other. As recited in claim 15, the method comprises: preheating the sheet; placing the preheated sheet on the first portion of the open mold; pressing the sheet against the first portion at at least one location using at least one pusher mounted on the second portion of the mold and movable relative to said second portion; closing the mold and compacting the sheet; and unmolding the part.

Claim 16 similarly recites a method comprising: preheating the sheet; placing the preheated sheet on the first portion of the open mold; pressing the sheet against the first portion at at least one location using at least one pusher mounted on the second portion of the mold and movable relative to said second portion; closing the mold, a portion of the sheet projecting from the join plane after the mold has closed; compacting the sheet; trimming of the portion of the sheet that projects from the join plane; and unmolding the part.

It is respectfully submitted that the applied references do not disclose, teach or suggest, in permissible combination, the features of claims 15 and 16. In particular, as discussed during the interviews, Dunbar does not disclose preheating the blanket 30. The Office Action asserts that it would have been obvious to preheat the blanket 30 in the process taught by Dunbar in order to facilitate the shaping of the sheet. Applicant respectfully disagrees.

Dunbar specifically teaches curing a binder material/matrix resin with the blanket 30 in the mold to hold the blanket 30 in its perform shape (col. 4, lns. 57-59). The binder material/matrix resin thus acts like a thermosetting composition. As described in the attached publication "Thermoplastic and Thermosetting Polymers", after a thermosetting polymer has been produced by heating, reheating the thermosetting polymer will soften, but will cannot be shaped or formed to any great extent.

As taught by Dunbar, the blanket 30 is heated after the blanket 30 has been shaped (col. 4, lns. 41-47). This is because the blanket 30 cannot be shaped after the binder material/matrix resin cures. A person of ordinary skill in the art would not be motivated to modify the process of Dunbar by introducing the added complexity of timing between preheating and shaping and introducing the potential for wasted materials because of premature curing. The process disclosed by Dunbar avoids any risk of premature curing that would render the blanket 30 unshapable. Thus, Dunbar teaches away from preheating as

recited in claims 15 and 16. As such, there is no motivation for one of ordinary skill in the art to modify Dunbar to add a preheating step.

During the interviews, the Examiners maintained that preheating is too well-known in the art of press molding. However, absent a motivation to modify the process of Dunbar to include a preheating step, it is respectfully submitted that the asserted modification is based on impermissible hindsight. Accordingly, the rejection of claims 15 and 16 under 35 U.S.C. §103(a) over Dunbar in view of JP 05154868 A, Yamazaki et al., Cesano, King et al. and Warburton is improper and should be withdrawn.

Claims 2-10 and 12-14 are patentable at least in view of the patentability of claims 1 and 11 from which they respectively depend, as well as for the additional features they recite. Accordingly, the rejection of claims 2-10 and 12-14 under 35 U.S.C. §103(a) over Dunbar in view of JP 05154868 A, Yamazaki et al., Cesano, King et al. and Warburton should be withdrawn as well.

New claims 18-30 are patentable at least in view of the patentability of claims 1 and 15 from which they respectively depend, as well as for the additional features they recite.

New claim 31 recites a method of manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other and a plurality of pushers movably mounted on the second mold portion. As recited in claim 31, the method comprises: placing the sheet on the first portion of the open mold; pressing the sheet against the first portion of the mold initially using at least one pusher situated substantially in the center of the mold, and then progressively using other pushers, a pusher furthest from the center of the mold being actuated last; closing the mold; compacting the sheet; and unmolding the part. It is respectfully submitted that none of the references of record disclose, teach or suggest these claimed features.

In particular, it is respectfully submitted that none of the references of record disclose, teach or suggest pressing the sheet against the first portion of the mold initially using at least one pusher situated substantially in the center of the mold, and then progressively using other pushers, a pusher furthest from the center of the mold being actuated last. Although original claim 3 recites such a feature, the Office Action does not explain how this feature is allegedly rendered obvious.

During the interviews, the Examiners maintained that Keen et al. discloses a plurality of pushers 12-14 that correspond to this claimed feature. Applicant respectfully disagrees.

Keen et al. discloses a multi-section male mold 20 comprising a center section 12, left and right intermediate sections 13L and 13R and left and right end sections 14L and 14R. Thus, the sections 12-14 are part of the male mold 20. As such, the sections 12-14 are not movably mounted on the second mold portion and thus cannot reasonably be considered to be pushers as recited in claim 31.

New claim 32 is patentable at least in view of the patentability of claim 31 from which it depends, as well as for the additional features it recites.

New claim 33 recites a method of manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other. As recited in claim 33, the method comprises: placing the sheet on the first portion of the open mold; pressing the sheet against the first portion at at least one location using at least one pusher mounted on the second portion of the mold and movable relative to said second portion; closing the mold; pre-trimming the sheet in such a manner that a first portion of the sheet is connected to a second portion of the sheet by a bridge of material extending between cut-outs; compacting the sheet; and unmolding the part. It is respectfully submitted that none of the references of record disclose, teach or suggest these claimed features.

In particular, it is respectfully submitted that none of the references of record disclose, teach or suggest pre-trimming the sheet in such a manner that a first portion of the sheet is connected to a second portion of the sheet by a bridge of material extending between cut-outs. Support for this claimed feature is provided by Fig. 7 and the corresponding text on page 7, lines 23-36 of the specification as originally filed.

New claim 34 is patentable at least in view of the patentability of claim 33 from which it depends, as well as for the additional features it recites.

New claim 35 recites a method of manufacturing a reinforced plastics material part from a sheet of drapable material comprising a thermoplastic material by using a mold comprising first and second mold portions that are movable relative to each other. As recited in claim 35, the method comprises: placing the sheet on the first portion of the open mold; pressing the sheet against the first portion at at least one location using at least one pusher mounted on the second portion of the mold and movable relative to said second portion; closing the mold; compacting the sheet; and unmolding the part. It is respectfully submitted that none of the references of record disclose, teach or suggest these claimed features.

As discussed above, Dunbar specifically discloses a binder material/matrix resin that acts like a thermosetting polymer. It is respectfully submitted that a thermoplastic is significantly different than such materials. For example, a thermoplastic may be reheated, reshaped and reformed, whereas the binder material/matrix resin of Dunbar cannot.

New claim 36 is patentable at least in view of the patentability of claim 35 from which it depends, as well as for the additional features it recites.

In view of the foregoing amendments and remarks, Applicant submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-36 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Petition for Extension of Time
Amendment Transmittal
Appendix
Publication

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APPENDIX

Changes to Claims:

Claims 18-36 are added.

The following is a marked-up version of the amended claims:

1/2 (Amended) A method of manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other, the method comprising the following steps:

- placing the sheet on the first portion of the open mold;
- pressing the sheet against the first portion at at least one or more locations by means of location using at least one or more pushers ~~pusher~~ mounted on the second portion of the mold and movable relative to said second portion;
- closing the mold, a portion of the sheet projecting from the join plane after the mold has closed;
- compacting the sheet;
- trimming off ~~the~~ a portion of the sheet ~~that projects~~ projecting from the join plane after the mold has closed; and
- unmolding the part.

2/2 (Amended) A method according to claim 1, ~~in which~~ wherein the sheet is pressed against the first portion of the mold initially substantially in the center thereof.

3/2 (Amended) A method according to claim 2, ~~in which~~ wherein the at least one pusher comprises a plurality of pushers and wherein the sheet is pressed against the first portion of the mold initially ~~by means of~~ using at least one or more pushers ~~pusher~~ situated substantially in the center of the mold, and then progressively by ~~means of~~ other pushers, the pushers furthest from the center of the mold being actuated last.

4~~1~~ (Amended) A method according to claim 1, ~~in which~~wherein trimming is performed by blades mounted on a cursor.

5~~1~~ (Amended) A method according to claim 4, ~~in which~~wherein the cursor has an inside wall of the cursor is arrangedconfigured so as to ~~co-operate~~cooperate with the mold to form a compression chamber, and ~~in which~~wherein thermoplastics material is overmolded on the sheet inside said compression chamber.

6~~1~~ (Amended) A method according to claim 5, ~~in which~~wherein the thermoplastic material is deposited by being extruded on the sheet before the mold is closed.

7~~1~~ (Amended) A method according to claim 5, ~~in which~~wherein the sheet is overmolded by injecting thermoplastics material into the mold after the mold has been closed.

8~~1~~ (Amended) A method according to claim 1, ~~in which~~wherein the first mold portion has at least one or more groovesgroove and the second mold portion has at least one or more ribssrib arranged to engage in said ~~groove(s)~~at least one groove, so as to trim the sheet at least in part around the outline of the ~~groove(s)~~at least one groove when the mold is closed.

9~~1~~ (Amended) A method according to claim 1, ~~in which~~wherein the first portion constitutes a die having a setback in its top portion such that the resulting part is of generally channel section, with the web of the channel section having an indentation whose concave side faces in the opposite direction to the concave side of the channel section.

10~~1~~ (Amended) A method according to claim 9, ~~in which~~wherein the second mold portion has at least one or more pusherspusher arranged to engage in the setback of the first portion.

11~~1~~ (Amended) A mold for forming a sheet of reinforced plastics material, the mold comprising:

first and second portions that are movable relative to each other;

at least one or more pushers ~~pusher~~ mounted on the second portion and movable relative thereto so as to press said sheet at least locally against the first portion before the mold is closed; and

at least one trimmer ~~means~~ enabling the portion of the sheet that projects from the join plane to be trimmed off once the mold is closed.

12~~1~~₂ (Amended) A mold according to claim 11, ~~in which~~ wherein the first portion has a setback and at least one of the pushers has an end of profile that corresponds substantially to the shape of the setback.

13~~1~~₂ (Amended) A mold according to claim 11, ~~in which~~ wherein one of the two mold portions has at least one or more grooves ~~groove~~ and the other portion has at least one or more ribs ~~srib~~ arranged to engage in said ~~groove(s)~~ at least one groove so as to perform partial trimming of the part that is produced.

14~~1~~₂ (Amended) A method according to claim 1, ~~in which~~ wherein the reinforced plastics material part is a structural part of a motor vehicle.

15~~1~~₂ (Amended) A method of manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other, the method comprising ~~the following steps:~~

- preheating the sheet;
- placing the preheated sheet on the first portion of the open mold;
- pressing the sheet against the first portion at at least one or more locations ~~by means of location using at least one or more pushers~~ pusher mounted on the second portion of the mold and movable relative to said second portion;
- closing the mold and compacting the sheet; and
- unmolding the part.

16. (Amended) A method of manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other, the method comprising the following steps:

- preheating the sheet;
- placing the preheated sheet on the first portion of the open mold;
- pressing the sheet against the first portion at at least one or more locations by means of location using at least one or more pushers ~~pusher~~ mounted on the second portion of the mold and movable relative to said second portion;

- closing the mold, a portion of the sheet projecting from the join plane after the mold has closed;

- compacting the sheet;
- trimming of the portion of the sheet that projects from the join plane; and
- unmolding the part.

17. (Amended) An apparatus for manufacturing a reinforced plastics material part from a sheet of drapable material by using a mold comprising first and second mold portions that are movable relative to each other, comprising:

means for placing the sheet on the first portion of the open mold;

means for pressing the sheet against the first portion at at least one or more locations by means of location using at least one or more pushers ~~pusher~~ mounted on the second portion of the mold and movable relative to said second portion;

means for closing the mold, a portion of the sheet projecting from the join plane after the mold has closed;

means for compacting the sheet;

means for trimming off the portion of the sheet that projects from the join plane; and

means for unmolding the part.